WHAT IS CLAIMED IS:

1. A laser irradiation method comprising:

irradiating a subject formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the subject so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein a wavelength of the first pulse laser beam is equal to or shorter than that of visible light, and a wavelength of the second pulse laser beam is longer than that of the first pulse laser beam.

2. A laser irradiation method according to claim 1, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

3. A laser irradiation method according to claim 1, wherein the second pulse laser beam is one selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

4. A laser irradiation method according to claim 1, wherein each the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

5. A laser irradiation method according to claim 1, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of

the first pulse laser beam, and d is a thickness of the substrate.

6. A laser irradiation method according to claim 1, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

7. A laser irradiation method comprising:

irradiating a semiconductor film formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the semiconductor film so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam melts the semiconductor film, and the second pulse laser beam satisfies $\alpha \geqq 10\beta$, where α denotes an absorption coefficient with respect to a molten state of the semiconductor film, and β denotes an absorption coefficient with respect to a solid state of the semiconductor film.

8. A laser irradiation method according to claim 7, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

9. A laser irradiation method according to claim 7, wherein the second pulse laser beam is one selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

10. A laser irradiation method according to claim 7, wherein each the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

11. A laser irradiation method according to claim 7, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

12. A laser irradiation method according to claim 7, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

13. A laser irradiation method comprising:

irradiating a semiconductor film formed over a substrate with a first pulse laser beam and a second pulse laser beam while relatively moving the semiconductor film so that areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam has a wavelength range of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^3 /cm or more, and the second pulse laser beam has a wavelength of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^2 /cm or less and an absorption coefficient with respect to a molten state of the semiconductor film is 5×10^3 /cm or more.

14. A laser irradiation method according to claim 13, wherein the first pulse laser beam is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$

laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

15. A laser irradiation method according to claim 13, wherein the second pulse laser beam is one selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

16. A laser irradiation method according to claim 13, wherein each the first pulse laser beam and the second pulse laser beam is shaped into a linear beam.

17. A laser irradiation method according to claim 13, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan (W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

18. A laser irradiation method according to claim 13, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

19. A laser irradiation device comprising:

a first laser oscillator which outputs a first pulse laser beam having a wavelength of equal to or shorter than that of visible light;

a second laser oscillator which outputs a second pulse laser beam having a longer wavelength than that of the first pulse laser beam;

a means for emitting the second pulse laser beam so as to be overlapped with an area which is irradiated with the first pulse laser beam;

a means for relatively moving a subject formed over a substrate with respect to the first pulse laser beam and the second pulse laser beam; and

a means for synchronizing a pulse period of the first laser oscillator with a pulse period of the second laser oscillator.

20. A laser irradiation device according to claim 19, wherein the first laser oscillator is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

21. A laser irradiation device according to claim 19, wherein the second laser oscillator is one selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

22. A laser irradiation device according to claim 19, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan (W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

23. A laser irradiation device according to claim 19, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

24. A laser irradiation device comprising:

a first laser oscillator which outputs a first pulse laser beam having a wavelength of equal to or shorter than that of visible light;

a second laser oscillator which outputs a second pulse laser beam having a longer wavelength than that of the first pulse laser beam;

a means for shaping the first pulse laser beam and the second pulse laser

beam into linear beams;

a means for emitting the second pulse laser beam so as to be overlapped with an area which is irradiated with the first pulse laser beam;

a means for relatively moving a subject formed over a substrate with respect to the first pulse laser beam and the second pulse laser beam; and

a means for synchronizing a pulse period of the first laser oscillator with a pulse period of the second laser oscillator.

25. A laser irradiation device according to claim 24, wherein the first laser oscillator is one selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

26. A laser irradiation device according to claim 24, wherein the second laser oscillator is one selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

27. A laser irradiation device according to claim 24, wherein the first pulse laser beam satisfies an inequality of $\phi1 \geqq \arctan (W1/2d)$, where $\phi1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

28. A laser irradiation device according to claim 24, wherein the second pulse laser beam satisfies an inequality of $\phi2 \geqq \arctan (W2/2d)$, where $\phi2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

29. A method for manufacturing a semiconductor device comprising:

forming an amorphous semiconductor film over a substrate;

crystallizing the amorphous semiconductor by irradiating the amorphous semiconductor film with a laser beam;

patterning the crystalline semiconductor film into a semiconductor layer; and

forming a channel formation region including at least a part of the semiconductor layer,

wherein areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein a wavelength of the first pulse laser beam is equal to or shorter than that of visible light, and a wavelength of the second pulse laser beam is longer than that of the first pulse laser beam.

30. A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

31. A method for manufacturing a semiconductor device according to claim 29, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

32. A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam and the second pulse laser beam are

respectively shaped into linear beams.

33. A method for manufacturing a semiconductor device according to claim 29, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan (W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

34. A method for manufacturing a semiconductor device according to claim 29, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan (W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

35. A method for manufacturing a semiconductor device comprising:

forming an amorphous semiconductor film over a substrate;

crystallizing the amorphous semiconductor film by irradiating the amorphous semiconductor film with a laser beam;

patterning the crystalline semiconductor film into a semiconductor layer; and

forming a channel formation region including at least part of the semiconductor layer,

wherein areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam melts the semiconductor film, and the second pulse laser beam satisfies $\alpha \geqq 10\beta$, where α denotes an absorption coefficient with respect to a molten state of the semiconductor film, β denotes an absorption coefficient with respect to a solid state of the semiconductor film.

36. A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

37. A method for manufacturing a semiconductor device according to claim 35, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a Ti: sapphire laser.

38. A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam and the second pulse laser beam are respectively shaped into linear beams.

39. A method for manufacturing a semiconductor device according to claim 35, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

40. A method for manufacturing a semiconductor device according to claim 35, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.

41. A method for manufacturing a semiconductor device comprising:

forming an amorphous semiconductor film over a substrate;

crystallizing the amorphous semiconductor film by irradiating the amorphous semiconductor film with a laser beam;

patterning the crystalline semiconductor film into a semiconductor layer; and

forming a channel formation region including at least a part of the semiconductor layer,

wherein areas which are irradiated with the first pulse laser beam and with the second pulse laser beam are overlapped with each other,

wherein oscillations of the first pulse laser beam and the second pulse laser beam are synchronized, and

wherein the first pulse laser beam has a wavelength range of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^3/cm or more, and the second pulse laser beam has a wavelength of which an absorption coefficient with respect to a solid state of the semiconductor film is 5×10^2/cm or less and an absorption coefficient with respect to a molten state of the semiconductor film is 5×10^3/cm or more.

42. A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam is emitted from a laser selected from the group consisting of an Ar laser, a Kr laser, an excimer laser, a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, a ruby laser, an alexandrite laser, a Ti: sapphire laser, a copper vapor laser, and a gold vapor laser.

43. A method for manufacturing a semiconductor device according to claim 41, wherein the second pulse laser beam is emitted from a laser selected from the group consisting of a CO_2 laser, a YAG laser, a Y_2O_3 laser, a YVO_4 laser, a $GdVO_4$ laser, a YLF laser, a $YAlO_3$ laser, a glass laser, an alexandrite laser, and a

Ti: sapphire laser.

44. A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam and the second pulse laser beam are respectively shaped into linear beams.

45. A method for manufacturing a semiconductor device according to claim 41, wherein the first pulse laser beam satisfies an inequality of $\phi 1 \geqq \arctan(W1/2d)$, where $\phi 1$ is an incident angle of the first pulse laser beam, W1 is a length of a major axis or a minor axis of the first pulse laser beam, and d is a thickness of the substrate.

46. A method for manufacturing a semiconductor device according to claim 41, wherein the second pulse laser beam satisfies an inequality of $\phi 2 \geqq \arctan(W2/2d)$, where $\phi 2$ is an incident angle of the second pulse laser beam, W2 is a length of a major axis or a minor axis of the second pulse laser beam, and d is a thickness of the substrate.